

SQL Server™ 2000 Tools Overview

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A large space shuttle is shown launching vertically on the right side of the slide. It has a white body with orange and black stripes. Bright orange and yellow flames and white smoke are coming from the engines at the bottom. In the top right corner, there are several small icons representing documents or spreadsheets, some connected by lines.

POWER

Windows DNA 2000

Readiness Conference

UP

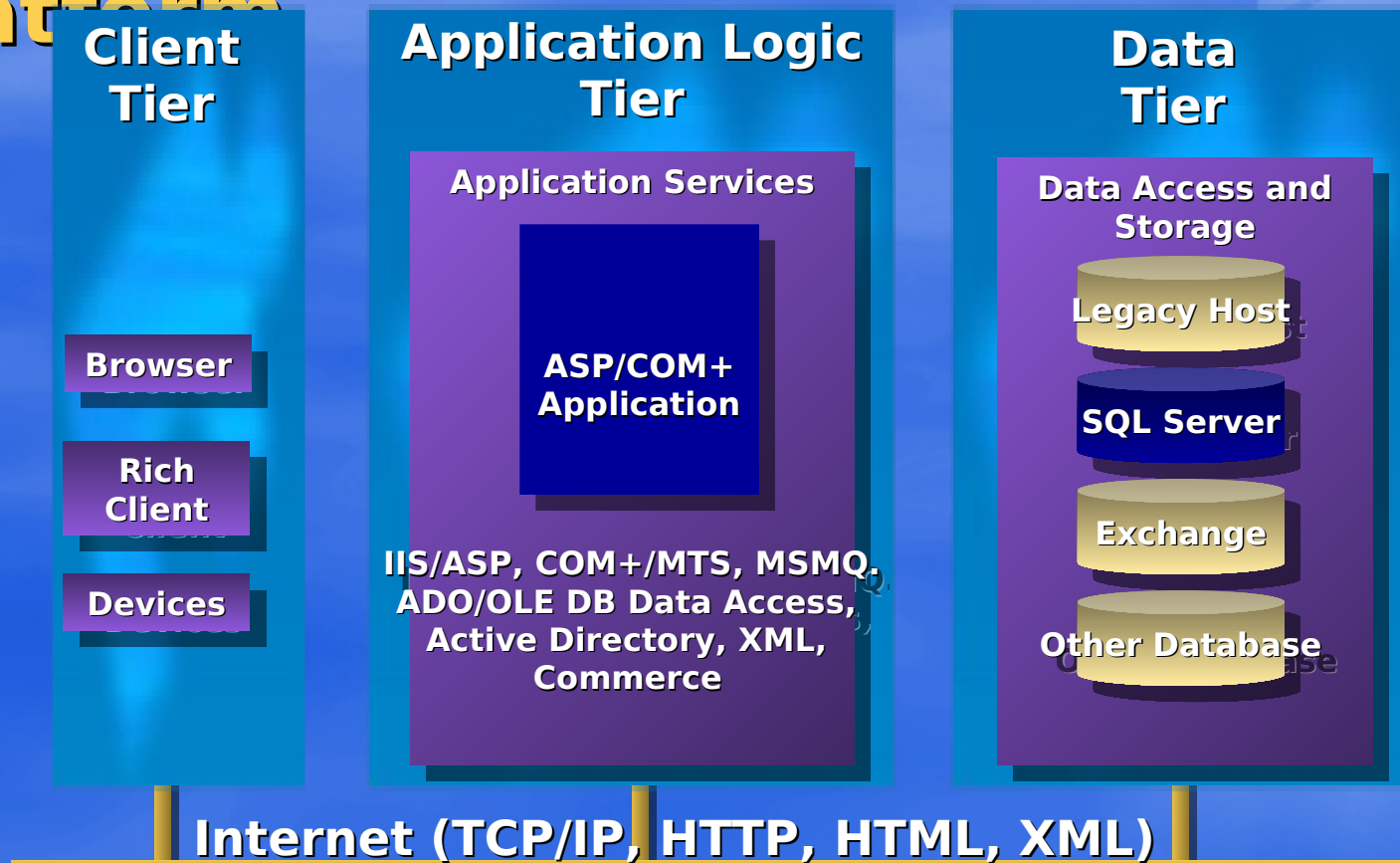
featuring SQL Server 2000

Agenda

- **Current Status, what did we learn**
- **Overview of the SQL Server 2000 Tools Enhancements and Changes**
- **Discussion**

Windows DNA 2000

Next Generation Web Application Platform



Microsoft
SQL Server 2000
Server2000
Microsoft
Application Center 2000



Microsoft Confidential

Microsoft
Commerce Server 2000
Microsoft
Host Integration Server 2000

Microsoft
BizTalk Server 2000

The Tools...

- **SQL Enterprise Manager (incl. SQL DMO, SQL NameSpace & Service Manager)**
- **SQL Query Analyzer**
- **SQL Profiler (incl. Index Tuning Wizard & Replay)**
- **Data Transformation Services**
- **SQL Agent**
- **Server & Client Network Utility**
- **ISQL / OSQL**
- **SQL Mail**

Tools Matrix

Management, Operations & Monitoring	DBA, Development, Performance Tuning	Data Movement & Job Execution
<ul style="list-style-type: none">• SQL Enterprise Manager<ul style="list-style-type: none">➢ Server Configuration➢ Object Creation➢ Job Scheduling➢ Maintenance• Service Manager• Server & Client Network Utility• Performance Monitor<ul style="list-style-type: none">➢ Server Monitoring• SQL Profiler	<ul style="list-style-type: none">• SQL Query Analyzer<ul style="list-style-type: none">➢ Query Authoring & Execution➢ Query Performance Analysis➢ T-SQL Debugging• SQL Profiler<ul style="list-style-type: none">➢ Server Tracing➢ Workload Perf. Analysis➢ Replay• Index Tuning Wizard	<ul style="list-style-type: none">• DTS<ul style="list-style-type: none">➢ Data Movement➢ Data Scrubbing➢ Job Execution➢ Workflow• SQL Agent<ul style="list-style-type: none">➢ Scheduling➢ Job Execution➢ Threshold and Event based job execution

Where did we learn...

- **Usability tests**
- **User feedback:**
 - **Actively trolling the newsgroups**
 - **Conferences (TechEd, PDC, Pass, VBits, etc.)**
 - **SQLWish alias (over feature 500 requests in 3 months, since start)**
 - **Beta feedback (newsgroup)**
- **1:1 Customer face time**
 - **ISV and customer lab**
 - **Customer visits**
 - **Internal Customers**



What did we learn...

- **Fragile, too easy to break**
- **SQL EM all dialogs are modal**
- **Scalability & performance**
- **Not all server functionality exposed**
- **Easy first steps, hard after that**
 - **Life after the Wizard is hard**
- **High security requirements**
 - **Mainly SA only, no roles, no profiles**

What did we learn... (2)

- **Copy & Paste from BOL, help files or existing stored procedures**
- **Samples, samples and samples**
 - **More, better, detailed and working**
- **Online documentation does not help**
- **SQL Profiler, too much information**

SQL Server™ 2000

- **Short development cycle**
- **Main focus**
 - **Stability & robustness**
 - **Add missing functionality**
 - **Incremental features**
 - **Performance**
 - **Cluster awareness of all tools**
 - **All tools must support version 7.0 and 2000**

Platforms & Dependencies

- **Multi Instance support**
 - Only 1 set of tools installed for all SQL Server instances per machine (2000 & 7.0)
- **Dynamic resource loading**
 - Based on connection LCID
- **Platform support**
 - Window 98, Windows 98 SE, Windows Me
 - Windows NT 4.0 SP5 and higher (incl. Embedded)
 - Windows 2000 (incl. Terminal Server)
- **IE 5 required (for Unicode & XML parser)**

SQL Enterprise Manager

- **UI support for**
 - **Attach / Detach database**
 - **Offline database**
 - **Column level permission (missing from 7.0)**
 - **Server Network Utility**
 - **Register server using AD browser**
 - **Reworked Linked Server UI & HTML Views**
- **Copy Database Wizard**
- **Log Shipping**
- **Visual Data Tools full Unicode**

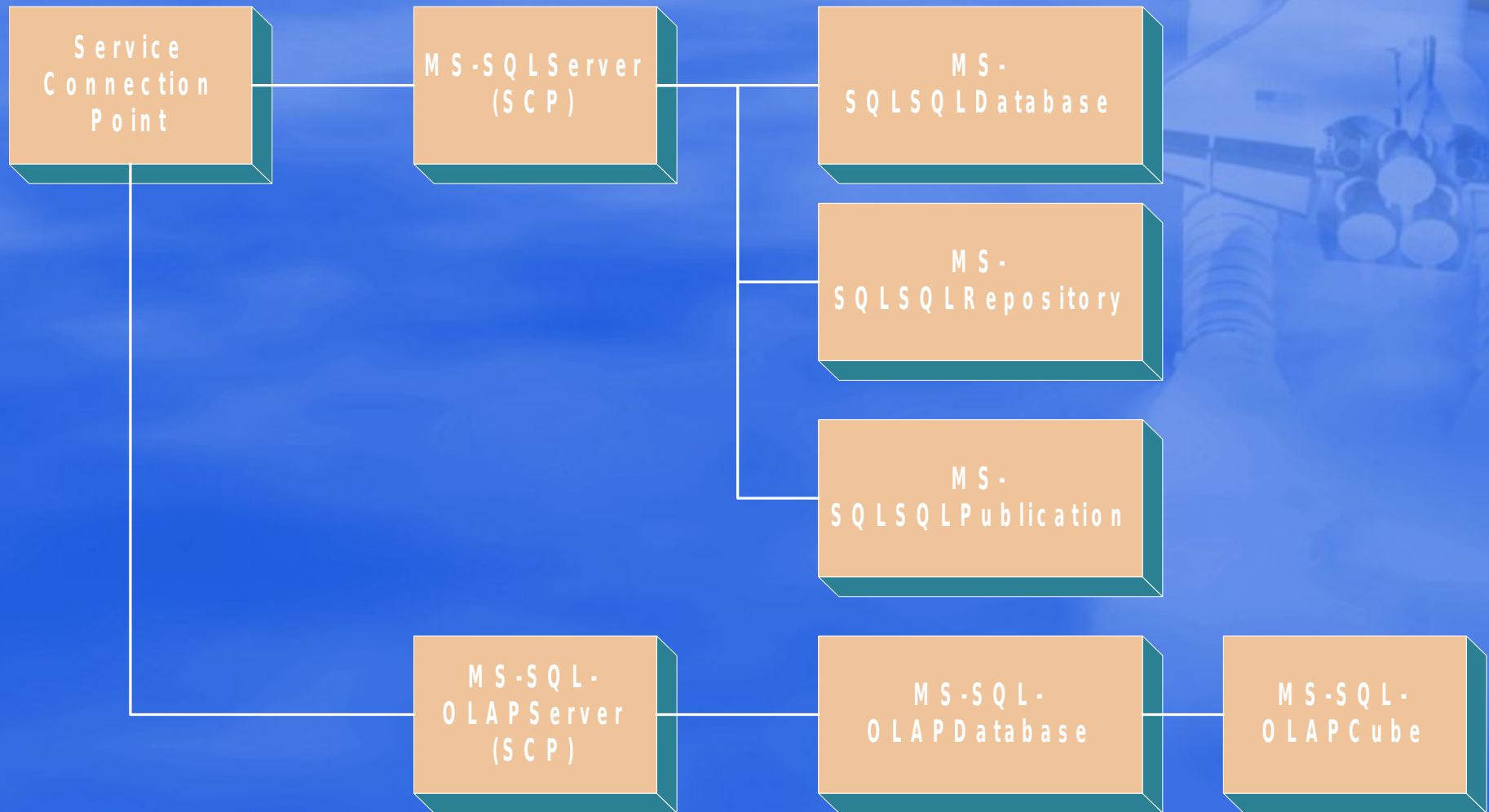
SQL Enterprise Manager

- Made Editor dialogs resizable (SP, trigger etc.).
- SQL DMO footprint reduction of over 50% in memory compared to 7.0 SP1.
- 7x Load time improvement, due to new Unicode redirection layer, compared to 7.0 SP1.
- Could not remove modal dialog restrictions in SQL EM

Active Directory™ Integration

- Service publication for SQL Server
 - also Databases, Replication Publications
- Domain-wide 'Locator' service
 - *"What SQL Servers are on the network?"*
- Objectives:
 - 1. Directory lookup
 - 2. Location Transparency - "HR" Server
 - Through aliases and connection points
- Generic AD SQL Server Browser

SQL Server AD Schema



SQL Server AD Search

SQL Active Directory Search

File View Help

In:

Server **Advanced**

Name:

Version:

Database:

☐ Include non-active directory servers into search

Find Now
Stop
Clear All

Name	Version	Build	Is Clustered	Last Updated
RICKG2000	8.0	41	No	2000-01-31 11
BPRANG42KAS	8.0	51	No	2000-01-31 11

SQL Active Directory Search

File View Help

In:

Server **Advanced**

Field: Condition: Value:

Add **Remove**

TCP/IP	Starts with	1433
Clustered	Is FALSE	
Registered Owner	Starts with	Rick

Find Now
Stop
Clear All

OK
Cancel

Name	Version	Build	Is Clustered	Last Updated
RICKG2000	8.0	41	No	2000-01-31 11

AD Registration when...

- **During server startup**
 - **sp_ActiveDirectory_Start**
 - **Register/update Service Connection Points**
 - **Registers missing databases**
 - **Updates database properties**
- **After Backup**
 - **Via trigger in MSDB**
 - **Update database properties**
- **Customized**
 - **Scheduled interval via recurring T-SQL Agent job**
 - **Manual via sp_ActiveDirectory_Start**

SQL AD Registration

SPs

- **sp_ActiveDirectory_SCP**
updates the SCP and optionally underlying DB objects
 - create_noupdate, create_with_db, create, update, delete, shutdown
- **sp_ActiveDirectory_OBJ**
updates underlying objects
 - create, update, delete
- **sp_ActiveDirectory_Start**
startup proc that simply calls **sp_ActiveDirectory_SCP**
 - `exec(N'master..sp_ActiveDirectory_SCP N''create_with_db'')`

Copy Database Wizard

- **Allows DBA to copy or move databases between SQL Servers or SQL Server instances.**
- **Move or copy 1 or n database(s)**
 - **From 7.0 / 2000 to 2000**
 - **Copy and resolve logins if not present on destination**
 - **Optionally copy global namespace objects from master, error messages and jobs from msdb**
- **Using detach and attach**
- **Restartable operations**

Copy Database Wizard

 Copy Database Wizard -- GERTD

Select the database to migrate

Databases with identical names on the destination server cannot be moved.



Move	Copy	Source : GERTD	Destination : GERTD\DEV
<input type="checkbox"/>	<input type="checkbox"/>	lexdb	OK
<input type="checkbox"/>	<input type="checkbox"/>	test	OK
<input type="checkbox"/>	<input type="checkbox"/>	testdb	OK
		Northwind	Already exist
		pubs	Already exist
		master	System database
		model	System database
		msdb	System database

Refresh

< Back

Log detail

Step detail

Status	Stename	Exec status	Start Time	End Time	Elapsed time	Error
✓	CDW Logins Task Step	4	2000-02-0...	2000-02-0...	4.356	0
✓	CDW Master Task Step	4	2000-02-0...	2000-02-0...	4.827	0
✓	CDW MSDB Task Step	4	2000-02-0...	2000-02-0...	8.432	0
✓	CDW Errors Task Step	4	2000-02-0...	2000-02-0...	1.132	0
✓	CDW Databases Task Step	4	2000-02-0...	2000-02-0...	21.491	0

Less Info <<<

Close

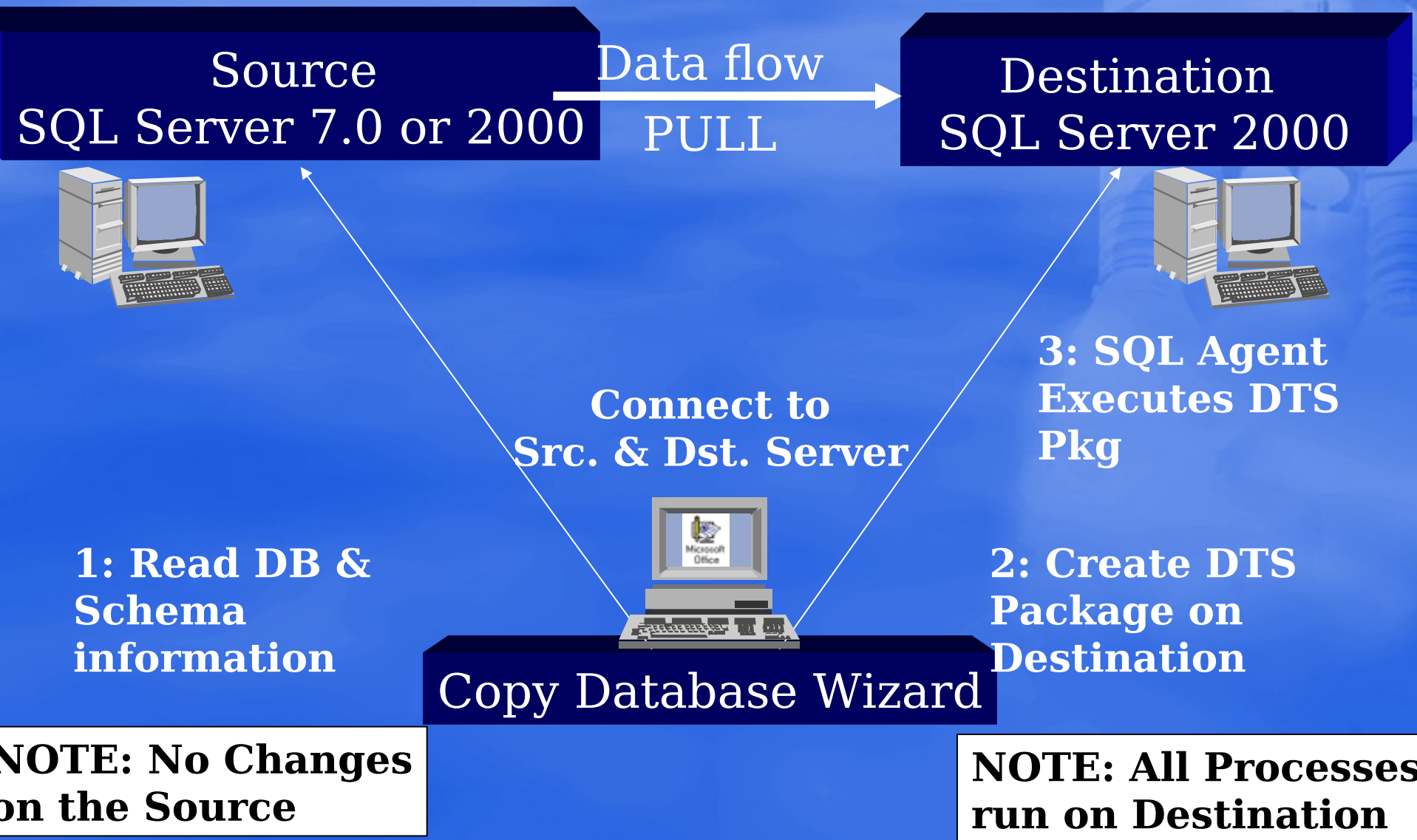
Task Detail

Status	Description	Error Code
✓	Begin to copy the database test	OK
✓	Put the database test in single user mode	OK
✓	Put the database test in read only mode	OK
✓	Try to detach the database test	OK
✓	Successfully detached the database test	OK
✓	Successfully copied the file \\GERTD\DMW\WIZD\MSSQL70...	OK
✓	Successfully copied the file \\GERTD\DMW\WIZD\MSSQL70...	OK
✓	Successfully attach the database test	OK

Copy Database Wizard

- **Can be used for:**
 - **Move databases between servers / instances**
 - **Server consolidation**
 - **Setting up test environments**
 - **Platform migration (Axp to x86)**
- **Implemented as DTS Tasks**
- **Processes (DTS packages) are executed on destination server.**
- **Wizard can be run on source, destination or third client.**

CDW Architecture



CDW Restrictions

- Database name changes during the copy/move are not allowed.
 - Prevents breaking queries like:
`select * from database.owner.table`
- Replicated database can not be moved or copied.
- Log shipped databases can not be moved.
- Win9x sources need to create share to access database files manually
- Need to be sysadmin member
- SQL Agent service need to run under Domain account

Log Shipping

- **Scheduled movement of T-logs**
 - **Pulled to secondary machine(s)**
 - **Copies all Logged Operations**
 - **DML + schema, permissions, roles,...**
- **Setup & managed via Maintenance 'Plan'**
 - **SQLMAINT.EXE**
- **Interactive remote monitoring**
- **Used for creating 'warm backup' DBs**
- **Uses RESTORE WITH STANDBY**
 - **SQL Server 2000 to SQL Server 2000 only**
- **Roll reversal (swap source <-> destination)**

Log Shipping Monitor

SQL Server Enterprise Manager - [Console Root\Microsoft SQL Servers\Test\LOGSHIPPING4 (Windows NT/2000)\Management\Log Shipping Monitor]

Console Window Help

Action View Tools

Tree

- Console Root
 - Microsoft SQL Servers
 - SQL 7.0
 - STARSVR (Windows NT/2000)
 - SQL Server Group
 - GERTD (Windows NT/2000)
 - GERTD\DEV (Windows NT/2000)
 - Test
 - LOGSHIPPING1 (Windows NT)
 - LOGSHIPPING2 (Windows NT)
 - LOGSHIPPING3 (Windows NT)
 - LOGSHIPPING4 (Windows NT)
 - Databases
 - Data Transformation Services
 - Management
 - SQL Server Agent
 - Backup
 - Current Activity
 - Database Maintenance
 - SQL Server Logs
 - Performance Analyzer
 - Log Shipping Monitor
 - Replication
 - Security
 - Support Services
 - Meta Data Services
 - SQL 6.5

Log Shipping Monitor 37 Items

Log Shipping Pair

- LOGSHIPPING1.60 Compatible Database - LOGSHIPPING2.60 Compatible Database
- LOGSHIPPING1.60 Compatible Database - LOGSHIPPING3.60 Compatible Database
- LOGSHIPPING1.60 Compatible Database - LOGSHIPPING4.60 Compatible Database
- LOGSHIPPING1.65 Compatible database - LOGSHIPPING2.65 Compatible database
- LOGSHIPPING1.65 Compatible database - LOGSHIPPING3.65 Compatible database
- LOGSHIPPING1.65 Compatible database - LOGSHIPPING4.65 Compatible database
- LOGSHIPPING1.70db - LOGSHIPPING2.70db
- LOGSHIPPING1.70db - LOGSHIPPING3.70db
- LOGSHIPPING1.70db - LOGSHIPPING4.70db
- LOGSHIPPING1.Baseball - LOGSHIPPING2.Baseball
- LOGSHIPPING1.Baseball - LOGSHIPPING3.Baseball
- LOGSHIPPING1.Baseball - LOGSHIPPING4.Baseball
- LOGSHIPPING1.Basketball - LOGSHIPPING2.Basketball
- LOGSHIPPING1.Basketball - LOGSHIPPING3.Basketball
- LOGSHIPPING1.Basketball - LOGSHIPPING4.Basketball
- LOGSHIPPING1.BigDB - LOGSHIPPING2.BigDB
- LOGSHIPPING1.BigDB - LOGSHIPPING3.BigDB
- LOGSHIPPING1.BigDB - LOGSHIPPING4.BigDB
- LOGSHIPPING1.Finance - LOGSHIPPING2.Finance
- LOGSHIPPING1.Finance - LOGSHIPPING3.Finance
- LOGSHIPPING1.Finance - LOGSHIPPING4.Finance
- LOGSHIPPING1.Human Resources - LOGSHIPPING2.Human Resources
- LOGSHIPPING1.Human Resources - LOGSHIPPING3.Human Resources
- LOGSHIPPING1.Human Resources - LOGSHIPPING4.Human Resources
- LOGSHIPPING1.Membership - LOGSHIPPING2.Membership
- LOGSHIPPING1.Membership - LOGSHIPPING3.Membership

Log Shipping Pair Properties

Status Source Destination

LOGSHIPPING1.Finance → LOGSHIPPING2.Finance

Status: Secondary out-of-sync

Current date / time on Monitor server: Wednesday, February 09, 2000

Last backup file: Finance_tlog_200002091600.TRN

Updated: 2/9/2000 4:00:14 PM

Backup delta: 1 minutes

Last file copied: Finance_tlog_200002091600.TRN

Updated: 2/9/2000 4:00:19 PM

Copy delta: 1 minutes

Last file loaded: Finance_tlog_200002091600.TRN

Updated: 2/9/2000 4:00:26 PM

Load delta: 0 minutes

OK Cancel Help

Microsoft Conf

Log-Shipping Architecture

Primary Server

Secondary Server (1..n)

Monitoring Server

1. BACKUP T-LOG

3. RESTORE T-LOG WITH STANDBY

T-Log Dump

T-Log Dump

2. Log COPY ("Pulled")

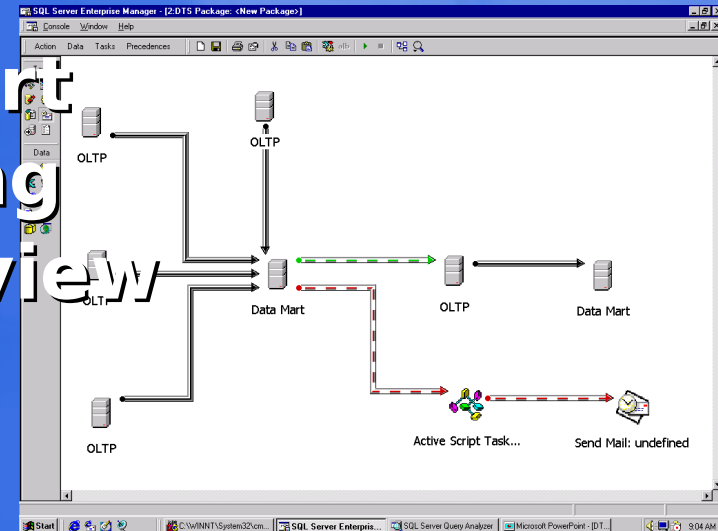
→ "SQL Agent" Scheduled Jobs

Data Transformation Services

- Multi phase data pump (package / step restart ability, aggregation)
- **Heterogeneous PK/FK/Constraints**
 - Oracle, Access, Sybase, ...
- **DTS package - Save as VB**
- **Support for Run-Time parameters**
 - DTSRUN UI
- **Improved Usability / Performance**
- **New Custom Tasks**
 - FTP, MSMQ, Execute Pkg, Dynamic Properties
- **New Custom Transformations**
 - UpperString, LowerString, MidString,

Data Transformation Services

- **Miscellaneous**
 - **Disconnected Edit Mode**
 - **Test Mode Support for global var & lookups**
 - **Parallel DataPump Task (to support hierarchical rowsets, programmatic access only)**
 - **Linked Server Support**
 - **Run Time UDL Binding**
 - **Bulk Insert - file preview**
 - **Package Logging**



SQL Trace (server side)

- **Fully integrated with the server scheduler**
 - **Improved scalability**
 - **Server side output files for better I/O**
 - **Self describing file format**
 - **Reduced disk footprint (removes redundant information)**
 - **No more file format changes when adding events.**
- **XP replaced by internal server stored procedures.**
- **Time and size based traces**
- **File roll-over on size X (needed for Auditing)**

Auditing

- **Driven by C2 Security**
- **Implemented using SQL Trace**
 - **File roll-over on size**
 - **Shutdown SQL Server when out of space**
 - **SQL Profiler can be used to read audit trail**
 - **No separate auditing UI in this release**
 - **C2 auditing via switch on the server**

`exec sp_configure 'c2 audit mode', 1`

SQL Profiler

- **Connection based like SQL Query Analyzer**
- **Trace Templates**
 - **Replaces Create Trace Wizard and Trace Definitions saved in Registry**
 - **Canned scenario based traces, like Dead Lock, Replay, Tuning, Stored Procedure (steps) etc.**
- **Support server side trace file creation**
- **Table and File writer as trace destination**
- **Support for Large Traces /**

Index Tuning Wizard


- **Added support for Indexed Views and indexes on computed columns**
- **Projected Volumes (via scaling factor)**
- **Index Analysis in Query Analyzer replaced with full Index Tuning Wizard**
 - **Works on current script file or**
 - **High-lighted selection within script**
- **Display indexes to be deleted on**

Index Tuning Wizard











Index Tuning Wizard - GERTD\DEV

Index Recommendations

For the given workload, you should see improved performance by implementing the following index recommendation.



Recommended indexes:

Clustered	Index name	Table/View name	Column name
<input checked="" type="checkbox"/>	 [_hypmv_21]	 [dbo].[_hypmv_2]	[_hypmv_...]
<input checked="" type="checkbox"/>	 [PK_Order_Detail...]	 [dbo].[Order_Details]	[OrderDet...]
<input type="checkbox"/>	 [Order_Details10]	 [dbo].[Order_Details]	[OrderID]. ...]
<input type="checkbox"/>	 [Order_Details11]	 [dbo].[Order_Details]	[Productl...]
<input checked="" type="checkbox"/>	 [PK_Orders_1__15]	 [dbo].[Orders]	[OrderID]

If you choose to implement the recommended changes, you should see the following improvement:

- 29% improvement in performance based on the sampled workload.

Analysis ...

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Next >

Cancel

SQL Query Analyzer (1)

- **Increased Usability / Authoring**
 - Multiple result sets to grid
 - Editor enhancements
 - Block indent, block comment out
 - Bookmarks in editor
- **Object Browser**
 - Drag / Drop Scripting, editing
 - Open Table (table editor)
 - Extended Property Editor
 - Browser docked left or right in shell
- **Object Search**
- **Templates and Parameter Search / Replace**

SQL Query Analyzer (2)

- **Integrated Statement Tracing**
 - Basic statement, duration, CPU, I/O
- **Complete integration of Tuning Wizard instead of Index Analysis**
- **Client Statistics (client side performance counters)**
- **Shortcut Queries**
 - Assign SP's, XP's, short SQL Statements to pre-defined key combinations
 - Alt+F1, Ctrl+F1, Ctrl + 1...0
- **Custom commands**
 - Basic shell out like Visual Studio® 6
 - Command line version control integration

SQL Query Analyzer (3)

- **Open Table with updateable grid**
 - **Need PK or Unique index on table, using server side keyset cursor**
- **Integrated T-SQL Debugger**
 - **Stored procedure debugging**
 - **Global, local variables, call stack**
- **Version dependent and case sensitive color coding for SQL Server 6.5, 7.0 and 2000**
- **Manage Indexes, index distribution information**

Miscellaneous...

- **SQL Agent**
 - **Multi-instance changes & bug fixes only**
- **SQL Mail**
 - **No functional changes**
 - **Rewritten to support:**
 - **ODBC instead of DB-Library**
 - **Extended MAPI instead of Simple MAPI**
 - **Support Unicode and Long parameters**
- **Web Assistant**
 - **No functional changes**
 - **Support Unicode and Long parameters**

More on SQL Server Tools ?

- **Birds of a feather - Wed, Mar 1, 5:45**
 - **Come say hello, if you have...**
 - **Questions, Suggestions, Complaints, Cool stuff to share!**
- **1-203 Scripting SQL Server Administration**
- **1-310 SQL Server Tools for Performance Tuning**
- **2-303 Developing for Data Transformation Services**
- **4-206 DTS - Overview and Enhancements**
- **4-310 Advanced DTS and Data**

More information:

- <http://www.microsoft.com/sql>
- <http://msdn.microsoft.com/sqlserver/>
- Newgroups
(msnews.microsoft.com)
 - microsoft.public.sqlserver.*
 - microsoft.public.data.*
- Feature or functionality requests
 - Email: sqlwish@microsoft.com

? Questions?



Ask them now!
or send e-mail to:
gertd@microsoft.com

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